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Pressure feed device for shelves

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(71) Applicant(s)

Artform International Limited

(Incorporated in the United Kingdom)

**Bishop Meadow Road, LOUGHBOROUGH, Leics,
LE11 0RE, United Kingdom**

(72) Inventor(s)

Peter Crown

(74) Agent and/or Address for Service

Dibb Lupton Broomhead

1 Cottage Road, LEEDS, LS6 4DD, United Kingdom

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(56) Documents Cited

US 5265738 A

US 5240126 A

US 5111942 A

US 4588093 A

US 4351439 A

US 4303162 A

US 4300693 A

(58) Field of Search

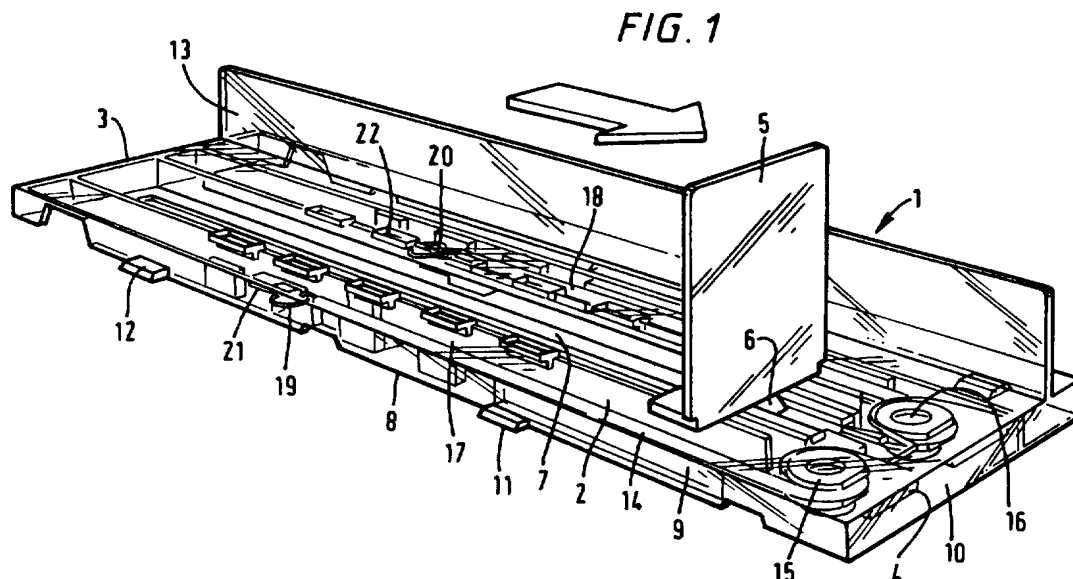
UK CL (Edition N) **A4B , B8U UL**

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(54) Pressure feed device for shelves

(57) A pressure feed device comprising an elongate channel or surface adapted to receive a plurality of articles in a row, and a spring 14 activated cursor 5 slidable in the channel or along the surface and arranged to urge a row of articles received in the channel or on the surface towards the front end thereof, wherein there are provided means for varying the force applied by the spring to the cursor, or wherein the spring is a roll spring and the force applied by the spring to the cursor increases with the distance of the cursor from the front end of the channel or surface. As shown the ends of springs 14 remote from cursor 5 can be secured at a number (5) of different locations.



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FIG. 1

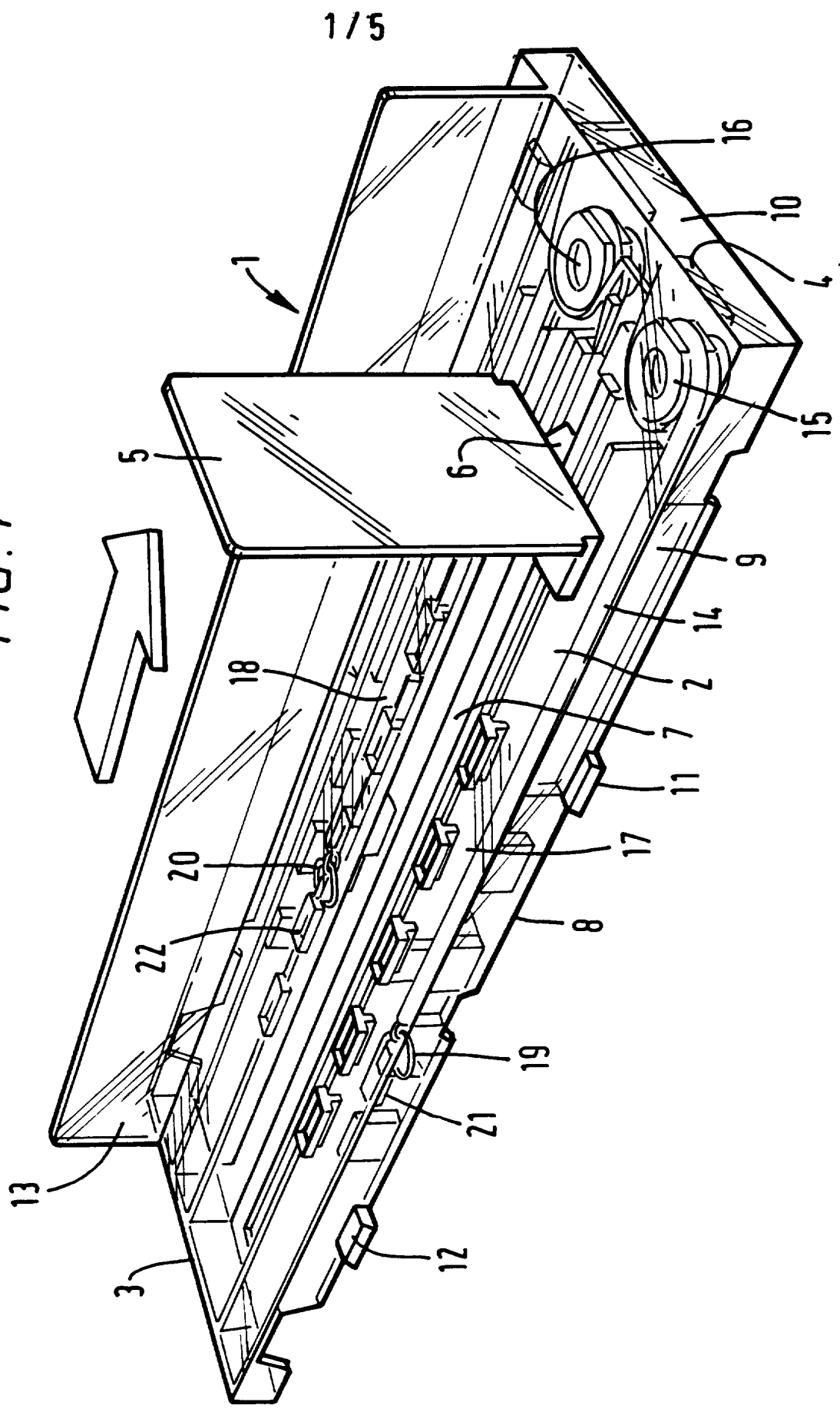
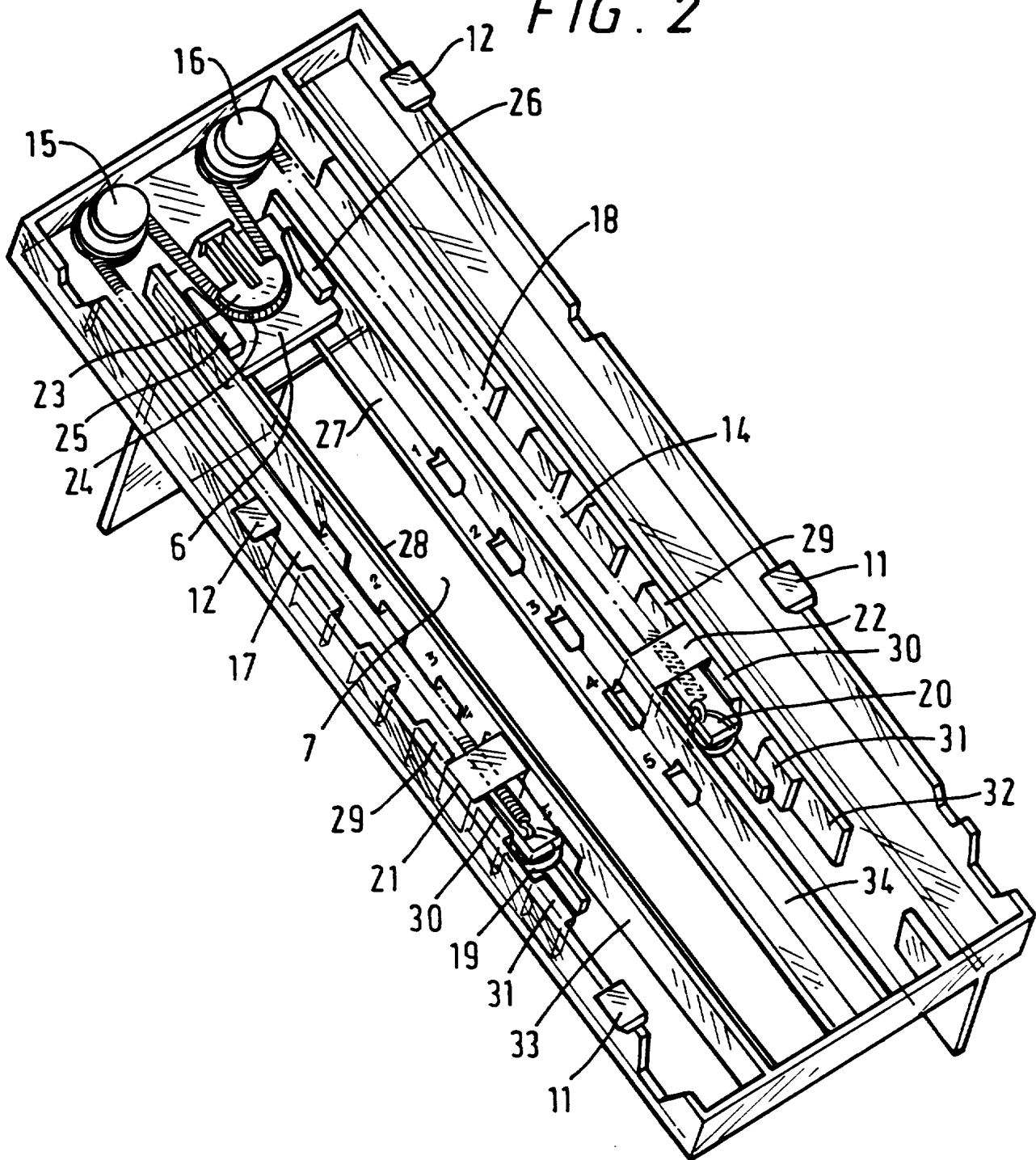
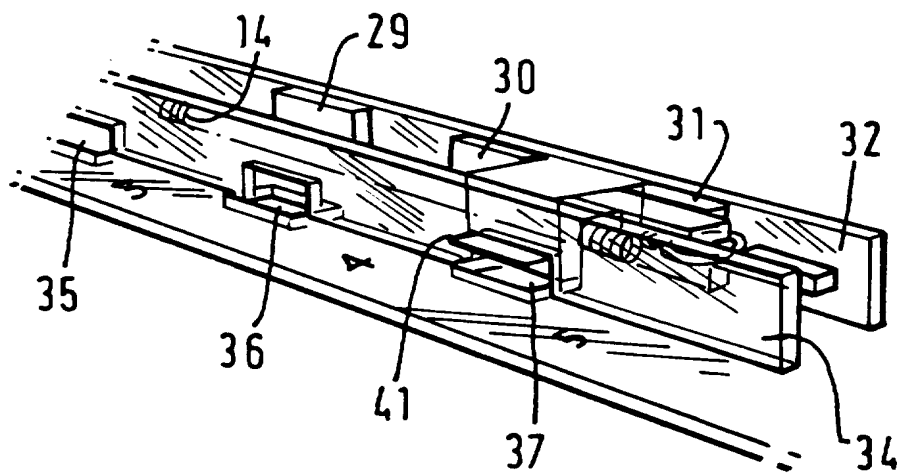
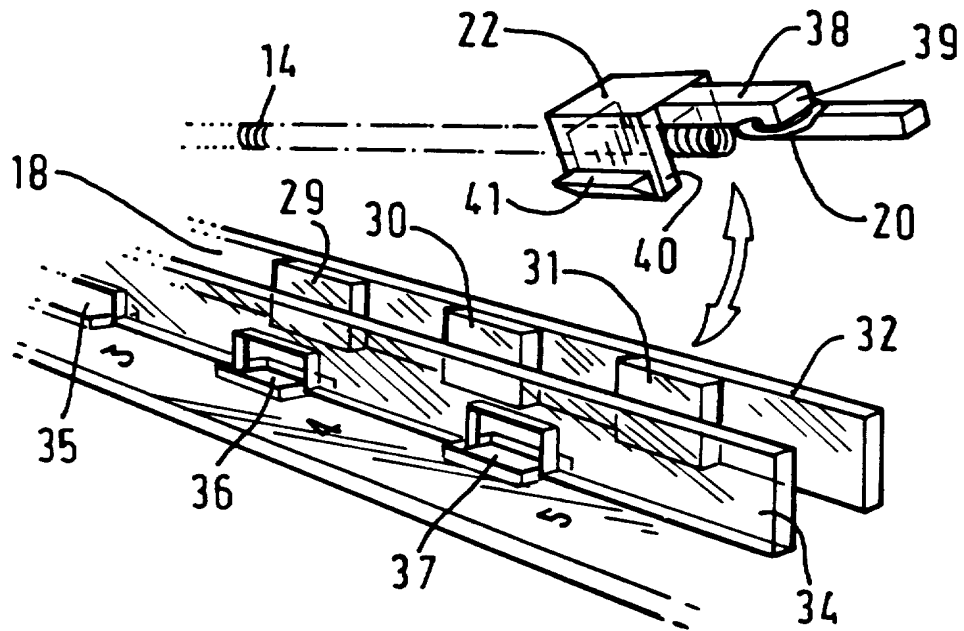
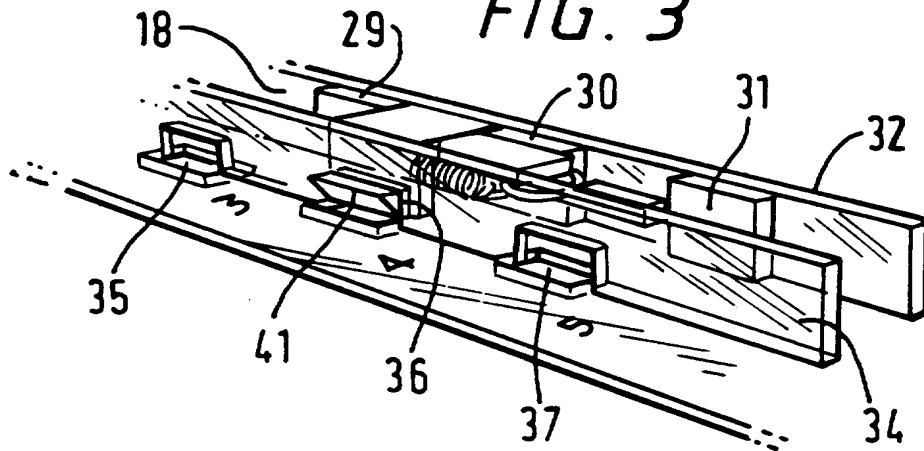


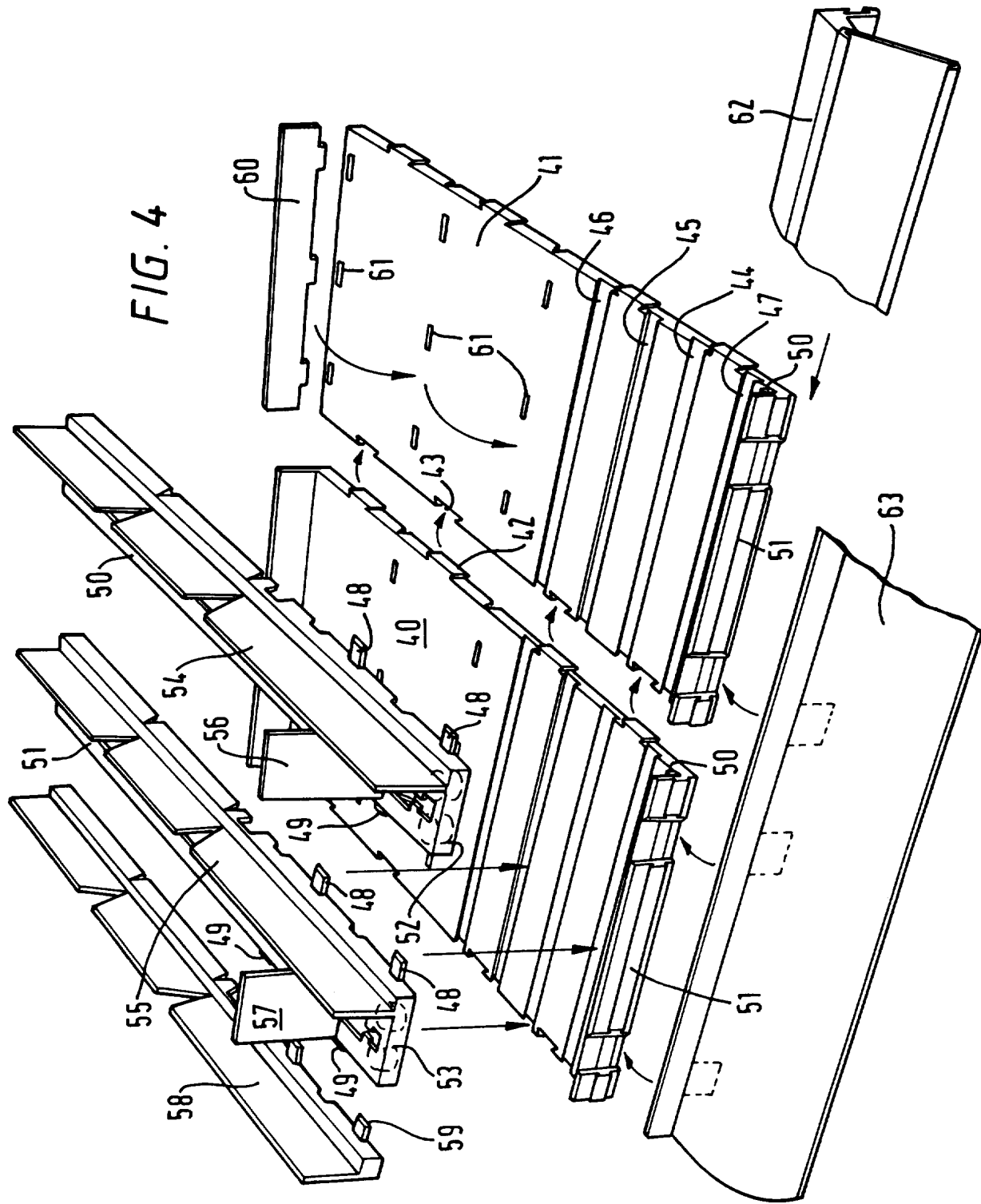
FIG. 2

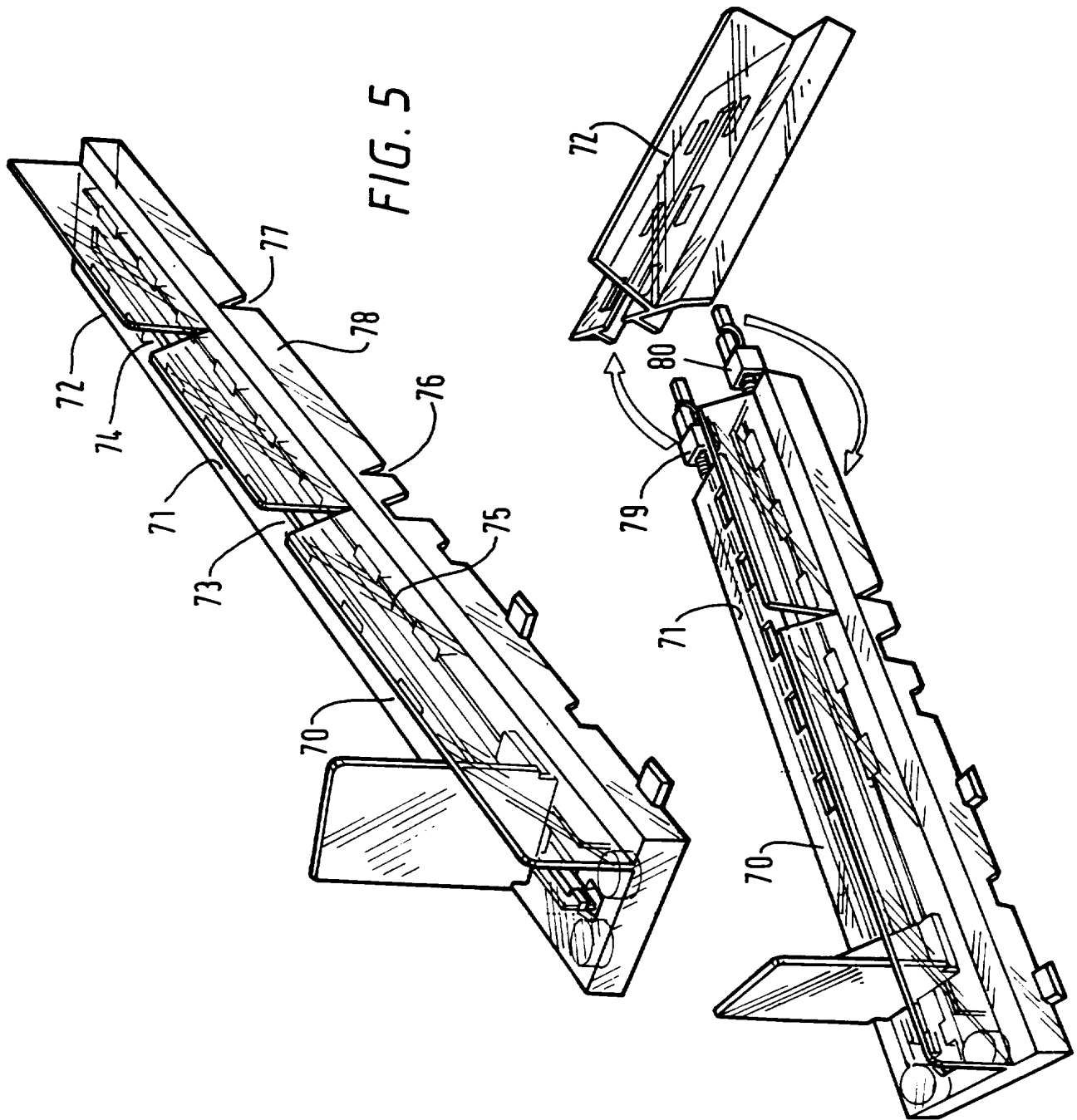


3/5

FIG. 3







PRESSURE FEED DEVICE

This invention relates to a pressure feed device, and more particularly to a pressure feed device for
5 product organisation and discipline, for example, in a display or on a shelf in a shop or supermarket.

Pressure feed devices for product organisation and discipline are widely used in shops and supermarkets for
10 customer self-selection. They generally comprise a tray member defining a channel, within which the products can be arranged in a row, and a spring-activated cursor which acts on the last product in the row to urge the products towards the front of the tray. Examples of such pressure
15 feed devices are described in GB2205226,

The pressure feed device may incorporate one or more shelf dividers and may be integral therewith, as described in our copending UK Patent Application No.
20 GB9407324.4. The pressure feed device may also incorporate projections or feet which can be received in elongate channels, grooves or recesses of a shelf member for locating the device, as described in our copending UK Patent Application No. GB9415753.4.

25

In another known pressure feed device, described in US5111942, the cursor is attached to a slide member disposed in a central guide passage under the channel of

the tray member, and two side passages are provided to either side of the central passage. The return spring for the cursor describes at least one outward run in each of the side passages between at least one direction-
5 changer pulley wheel and an anchor point. The entire disclosures of all the abovementioned patents and patent applications are specifically incorporated herein by reference.

10 In all the prior art pressure feed devices, the spring activation of the cursor presents a problem. This is because the force necessary to urge the row of products towards the front of the device varies depending on the size and weight of the products and the length of
15 the row. For example, many prior art devices use a roll spring which exerts a substantially constant force on the cursor, whatever the position of the cursor in the channel. This can result in the applied force being too low when the channel is full, so that the products do not
20 move to the front of the channel, and too high when there are only a few products remaining thus making them difficult to remove.

US5111942 describes in one embodiment a modular
25 design in which a basic module can be combined with a variable number of extension modules in order to increase the length of the device, but provides no means for varying the force applied to the row of products.

According to the present invention these disadvantages are overcome by providing a pressure feed device wherein the applied force can vary, or be varied, to suit the application.

5

In one aspect the present invention provides a pressure feed device comprising an elongate channel or surface adapted to receive a plurality of articles in a row, and a spring activated cursor slidable in the
10 channel or along the surface and arranged to urge a row of articles received in the channel or on the surface towards the front end thereof, wherein there are provided means for varying the force applied by the spring to the cursor, or wherein the spring is a roll spring and the
15 force applied by the spring to the cursor increases with the distance of the cursor from the front end of the channel or surface.

In a first preferred embodiment, the cursor can be
20 acted upon by an elongate spring member, for example, a tension spring, and means are provided for varying the mounting position of an end of the spring member remote from the cursor whereby the force applied by the spring member to the cursor can be varied. Preferably the force
25 applied by the spring member to the cursor also increases with the distance of the cursor from the front end of the channel or surface.

In a second preferred embodiment, the spring is a roll spring which is wound such that the force applied by the spring to the cursor increases as the spring is stretched (unwound).

5

A pressure feed device according to the first preferred embodiment can, for example, be provided with a series of locating points arranged along the length of the device whereby an end or portion of the spring remote
10 from the cursor can be mounted or fixed. The locating points can comprise, for example, lugs or projections for receiving a ring or hook at the said end of the spring or for insertion between adjacent turns thereof. Alternatively the locating points may be depressions or
15 openings within which an appropriately shaped anchor member attached to the said end or to a portion of the spring may be received.

In a particularly preferred example of the first
20 embodiment of the invention, the device is provided with at least one direction-changer pulley wheel and the spring extends from a locating point, to the pulley wheel, passes around the pulley wheel, and from there extends to the cursor.

25

A pressure feed device according to the second preferred embodiment can, for example, be provided with a roll spring acting on the cursor, which spring has

turns such that the radial distance between adjacent turns increases with the distance from the centre of the spring.

5 Where the force applied by the spring increases with the distance of the spring from the front end of the channel or surface, the force applied when the cursor is at the rear end of the channel or surface is preferably directly proportional to the spring extension, which, in
10 most cases will mean that the force applied is directly proportional to the distance of the cursor from the front end of the channel or surface.

 In the second embodiment there may also be provided
15 means for varying the force applied by the spring to the cursor, which means may comprise for example a pre-tensioning device comprising a winder and ratchet mechanism.

20 The invention finds particular application in pressure feed devices according to US5111942 and UK Patent Applications Nos. GB9407324.4 and GB9415753.4 and these are the preferred configurations for use herein.

25 In both the first and second embodiments it is possible to arrange the tension of the spring such that it is slack for the first few centimetres of movement of the cursor to provide a "soft start". This is useful

when dealing with large articles and can help to prevent any "snap back" of the cursor when the last one or two articles are removed from the device.

5 A particular advantage of the present invention is that in preferred embodiments it permits the tray or surface to be produced in any length, and for example, it is possible to manufacture the device in a standard length and provide break-off points along the length of
10 the device in order that sections can be broken off to enable the device to fit any depth of shelf.

Embodiments of the invention will now be described, by way of example only, with reference to the
15 accompanying Drawings in which:

Figure 1 shows a perspective view, from the top and one side, of a first embodiment of a pressure feed device according to the invention;

20

Figure 2 shows a bottom view of the device of Figure 1;

Figure 3 shows scrap views of the spring mounting
25 means of the device of Figures 1 and 2 illustrating the insertion of the anchor member into a locating point;

Figure 4 shows an exploded view of a shelf assembly according to the invention, illustrating the mounting of pressure feed devices as illustrated in Figures 1 to 3; and

5

Figure 5 shows a perspective view of a second embodiment of a pressure feed device according to the invention, illustrating the breaking off of a section at a predetermined point of weakness.

10

Referring firstly to Figures 1 to 3, the pressure feed device illustrated generally at 1 is adapted to urge a row of products placed on the surface 2 from the rear end 3 to the front end 4 thereof. A cursor 5 has a foot 15 6, slidable in a recessed channel 7 in the surface 2. The base 8 of the device is of a box-like construction, and comprises the upper supporting surface 2 and sides 9 and 10. In the drawings the device is illustrated as being made from transparent plastics material, in order 20 that the mechanism of the return spring and the locating means therefor can clearly be seen. It will be appreciated, however, that the device can be made from any suitable plastics or other material. The base 8 is provided with feet 11, 12, enabling the device to be 25 located on a display shelf, as will be explained hitherto. A longitudinal side wall 13 extends for the full length of the device and serves to keep the row of products correctly orientated. A second longitudinal

side wall (not shown) may be provided on the opposed longitudinal edge of the device from the side wall 13, if desired, but where a plurality of the devices are used side-by-side, this may not be necessary except for an
5 outermost device.

The return spring mechanism for the cursor 5 comprises a return spring 14 and a pair of direction changer pulley wheels 15 and 16. The return spring 14 is
10 located in side passages 17, 18, and has ring members 19, 20 at each end which are located respectively by anchor members 21, 22, as will more particularly be explained hereinafter.

15 Referring now to Figure 2, the foot 6 of the cursor 5 carries a semi-circular direction changer guide 23 having a semi-circular groove 24 for receiving the spring 14. Guide members 25 and 26 help to prevent the spring from becoming dislodged from the channel 24. The foot 6
20 slides on slideways 27, 28, positioned either side of the central channel 7.

As can be seen from Figure 2 and Figure 3, the device is provided with five locating points for the
25 anchor members 21 and 22, numbered 1 to 5. Each locating point is constituted by spaced apart abutments examples of which are shown at 29, 30, 31 (see Figure 3) which abutments project inwardly from the side walls 9, 32 into

the passageways 17, 18 respectively. The other side walls 33, 34 of the passageways 17, 18 have cut-out portions, three of which are illustrated at 35, 36 and 37, which are centrally disposed between the abutments 5 29, 30, 31.

The anchor member 22 is best illustrated in Figure 3, and it will be appreciated that anchor member 21 is of similar construction. The anchor member 22 is of 10 generally U-shaped construction, and has a tail 38 having a recessed groove 39 for receiving the ring member 20. An arm 40 of the U-shaped anchor member 22 is provided with a detent 41 which can be received in the cut-out recesses, examples of which are shown at 35, 36, 37, of 15 the wall 34.

The sequence of operations for increasing the tension of the spring 14, and thereby the force exerted by the cursor 5, is illustrated in Figure 3. By finger 20 pressure on the detent 41 the anchor member can be released from its position between abutments 29 and 30 whilst the end of the spring 14 is still attached thereto. The anchor member 22 can then be placed between the abutments 30 and 31 and pressed down until the detent 25 41 is firmly located in the cut-out recess 37. The anchor member is now firmly located in the side passage 18. In order to decrease the tension in the spring 14 the procedure is reversed. It will be appreciated that

anchor member 21 can be moved in a similar fashion within the side passage 17.

The effect of moving the anchor members 21, 22 sequentially from positions 1 to 5 as illustrated, increases the tension in the spring 14 and also increases the rate at which the tension in the spring 14 increases as the cursor 5 is moved from the front end 4 to the rear end 3 of the device.

10

Whilst the device illustrated in Figures 1 to 3 is shown with a single spring 14, it will be apparent that this could be replaced by two springs located in side passages 17 and 18, which would have their ends connected to the foot member 6, for example by hooks or some similar arrangement.

A shelf assembly using pressure feed devices according to the invention is illustrated in Figure 4. Shelf sections 40, 41 lock together by means of mortice and tenon joints 42, 43 and are supported in cantilever fashion from a rear vertical wall (not shown). The shelf sections have laterally extending recessed grooves 44, 45, 46, 47 within which the feet 48, 49 of a pair of pressure feed devices 50, 51 are located. A hollow rubber compressible tube 50 extends along the front edge of the shelf sections behind the front wall 51 is seated between the front wall 51 and the front ends 52, 53 of

the pressure feed devices 50, 51. The rubber tube 50 is a tight fit and exerts a rearwardly directed pressure on the front ends 52, 53 of the pressure feed devices 50, 51 in order to force the feet 48, 49 tightly into the
5 recessed grooves 44, 45, 46 and 47. The feet are tapered on one edge to fit within the undercut recesses in the grooves 44, 45, 46, 47 as described in our copending UK patent application No. GB9415753.4.

10 Each pressured feed device has an upstanding side wall 54, 55 which side walls form the side walls of a channel for the cursor 56. The channel for the cursor 57 comprises side wall 55 and is completed by an upstanding side wall 58 having feet 59 which are received in the
15 grooves 45 and 47. A rear wall 60 can be fixed in slots 61 in the shelf sections 40, 41, its position dependent upon the length of the pressure feed devices.

The front walls 51 of the shelf sections can
20 optionally be connected to a display section comprising a card-carrying profile 62 having slots for receipt of a card printed with sales or EPOS information, and a transparent curved plastics sheet 63 which overlies and protects the card.

25

Figure 5 illustrates a further embodiment of the invention in which the pressure feed device 70 is provided with break-off sections 71, 72 so that the

length of the device can be chosen depending upon the depth of the shelf. V-shaped grooves 73, 74 are cut into the side wall 75 in order to make points of weakness. Corresponding V-shaped grooves 76, 77 are cut into the
5 base 78. As illustrated, downward pressure upon the break-off section 72 causes a fracture at the grooves 74, 76 so that the section 72 becomes detached from the device. The anchor members 79, 80 can then be replaced in locating points in section 71, reducing the tension of
10 the return spring by an appropriate amount to compensate for the shorter length of the device.

The reader's attention is directed to all papers and documents which are filed concurrently with this
15 specification and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

20 All the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps or any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features
25 and/or steps are mutually exclusive.

Each feature disclosed in this specification (including any accompanying claims, abstract and

drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example
5 only of a generic series of equivalent or similar features.

The invention is not restricted to the details of the foregoing embodiments. The invention extends to any
10 novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

CLAIMS

1. A pressure feed device comprising an elongate channel or surface adapted to receive a plurality of articles in a row, and a spring activated cursor slidable in the channel or along the surface and arranged to urge a row of articles received in the channel or on the surface towards the front end thereof, wherein there are provided means for varying the force applied by the spring to the cursor, or wherein the spring is a roll spring and the force applied by the spring to the cursor increases with the distance of the cursor from the front end of the channel or surface.
2. A pressure feed device according to Claim 1, in which the cursor is acted upon by an elongate spring member.
3. A pressure feed device according to Claim 2, in which means are provided for varying the mounting position of an end of the spring member remote from the cursor whereby the force applied by the spring member to the cursor can be varied.
4. A pressure feed device according to Claim 1, in which the cursor is acted upon by a roll spring which is wound such that the force applied by the

roll spring to the cursor is proportional to the spring extension.

5. A pressure feed device according to any of Claims 1
5 to 3, wherein there is provided a series of locating points arranged along the length of the device whereby an end or portion of the spring remote from the cursor can be mounted or fixed.

10 6. A pressure feed device according to Claim 5, in which the locating points comprise lugs or projections for receiving a ring or hook at the said end of the spring or for insertion between adjacent turns of the spring.

15

7. A pressure feed device according to Claim 5, in which the locating points comprise depressions or openings within which an appropriately shaped anchor member attached to the said end or to a portion of
20 the spring may be received.

20

8. A pressure feed device according to any one Claims 1 to 3 or 5 to 7, in which the device is provided with at least one direction-changer pulley wheel and
25 a spring member extends from a locating point to the pulley wheel, passes around the pulley wheel, and from there extends to the cursor.

25

9. A pressure feed device according to Claim 4, in which the roll spring has turns such that the radial distance between adjacent turns increases with the distance from the centre of the spring.
- 5
10. A pressure feed device according to any of the preceding claims, in which the force applied by the spring member to the cursor is directly proportional to the distance of the cursor from the front end of the channel or surface.
- 10
11. An elongate pressure feed device having a body and a spring activated cursor slidable therealong, the body being provided with one or more break-off points along the length thereof such that one or more sections of the body can be broken off to shorten its length.
- 15
12. A pressure feed device according to any of Claims 1 to 10, having a body provided with break-off points according to Claim 11.
- 20
13. A pressure feed device substantially as described with reference to and as illustrated in the accompanying Drawings.
- 25
14. A pressure feed device substantially as hereinbefore described.

15. A shelf assembly comprising one or more feed devices according to any of Claims 1 to 14.

5 16. A shelf assembly substantially as hereinbefore described with reference to and as illustrated in Figure 4 of the accompanying Drawings.

17. A shelf assembly substantially as hereinbefore described.

Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

Application number
 GB 9500598.9

Relevant Technical Fields

(i) UK Cl (Ed.N) A4B; B8V - VL

(ii) Int Cl (Ed.6) A47F; A47B

Search Examiner
 MR J GRAHAM

Date of completion of Search
 5 APRIL 1995

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE DATABASE: WPI

Documents considered relevant
 following a search in respect of
 Claims :-
 1 (part) - 10, 12-14

Categories of documents

- | | |
|--|---|
| <p>X: Document indicating lack of novelty or of inventive step.</p> <p>Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p>A: Document indicating technological background and/or state of the art.</p> | <p>P: Document published on or after the declared priority date but before the filing date of the present application.</p> <p>E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p>&: Member of the same patent family; corresponding document.</p> |
|--|---|

| Category | Identity of document and relevant passages | | Relevant to claim(s) |
|----------|--|--|----------------------|
| X,Y | US 5240126 | (GILLETTE) see column 4 lines 55-57 | 1, 2, 8, 12 |
| X | US 4588093 | (FIELD) see column 3 lines 50-56 | 1, 10 |
| X | US 4351439 | (LEGGETT) see column 4 lines 48-52 | 1 |
| X | US 4303162 | (MEAD) see eg column 7 lines 52-63 | 1, 2, 10 |
| X | US 4300693 | (MEAD) see column 1 lines 33-38 and column 3 lines 12-20 | 1 |
| Y | US 5111942 | (BERNARDIN) see eg Figure 3 | 8 |
| Y | US 5265738 | (P.O.P.) see column 2 line 67 to column 3 line 5 | 12 |

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).